

Letters to the Editor.

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Science and Psychical Research.

IN NATURE of July 31, Dr. Tillyard, the well-known entomologist, reproaches Huxley for not being interested in the phenomena of what Sir Arthur Conan Doyle and others call spiritualism. He extends this reproach to all who consider the claim that from "the organism of the medium 'psychic stuff,' by the moulding of which they [the invisible operators] can produce at will the phenomena of independent voice, levitation, materialisations of portions of their personalities, and so on," so highly improbable that they refuse to spend their time and energy in the efforts required for obtaining or refuting proof. Yet it is by such limitations, and by them only, that science has hitherto obtained its results.

No doubt Dr. Tillyard, guided by the experience which he gained during a long and successful career in entomology, would refuse to investigate reputed cases of insects with bony skeletons suckling their young. Why then should he be so hard on the physicist who, on the ground of his experience, refuses to investigate levitation, or on the biologist who, mindful of Harvey's *omne vivum ex ovo*, considers his time better spent in his usual pursuits than in an investigation of reputed "materialisations of portions of personalities"?

Dr. Tillyard evidently approves of the scientific movement which displaced the medieval church from its position as the guardian of all knowledge—natural as well as supernatural. Why then should he object to that great majority of his fellow-scientists who think that the change would be for the worse if they accepted the guardianship of the medium? This, however, is what Dr. Tillyard really advocates; he is not satisfied with the liberty accorded ungrudgingly to any one willing to investigate even the most improbable phenomena; he wants physicists and biologists to leave "the broad highway" of science and to enter "The neglected side-path, foul with mire and overgrown with noxious weeds" along which the medium is anxious to guide them. If science did so help, its name would be superstition.

J. P. LOTSY.

LIKE Mr. Campbell Swinton, Dr. Lotsy confuses psychical research with spiritualism; he then charges me with reproaching Huxley for refusing to be interested in the latter! If he will again read carefully through the third paragraph of my article and follow it logically with the beginning of the fourth, he will see how far he has wandered from my meaning. He then selects the rarest and most puzzling of all psychical phenomena, namely, the ideoplastic moulding of teleplasm into forms resembling "portions of personalities," and says that I extend my reproach to all who refuse to consider this as a valid phenomenon worthy of scientific study! This would be rather like reproaching a peasant who lived in the middle of Asia for refusing to believe in the existence of submarines when he had never even seen the sea!

Dr. Lotsy is quite sure about what I would do if I were confronted with reputed cases of "insects with bony skeletons suckling their young." I am not!

If one of our leading entomologists were to write to me and state that he had observed a case of one of the higher pupiparous Diptera suckling its young, I should most certainly want to investigate it, though I might feel sceptical about his use of the term "suckling." The more improbable the reputed facts, the more I should consider the weight to be attached to the reputation of the man who made the statement. If the fact were vouched for by three entomologists of the standing in their own science that Lodge, Crookes, and Richet hold in theirs, I should consider that a good case for investigation had been made out. The weak point of Dr. Lotsy's argument is that he tries to draw a comparison between something in entomology which has never been even 'reputed' to occur and something in another branch of science which many leading men of science state clearly has occurred in their presence under test conditions; so that the only question which remains is to decide whether it is really true or whether they are liars or under delusions.

As for Harvey's *omne vivum ex ovo*, I doubt very much if modern biologists are compelled to regard this as a strictly accurate statement of the origin of life. Certainly Dr. Lotsy himself does not, for he has been trying for years to get them to accept instead his own emendation of *omne vivum ex hybrido*! Personally I prefer Harvey's dictum, but I do not think that the first unit of life that appeared on our world was either an egg or a hybrid. Moreover, the phenomena of teleplasm do not controvert Harvey's statement. For the 'psychic stuff' itself is admittedly drawn from the physical organism of the medium, and the medium is "ex ovo." Even if the ideoplastic moulding is really done, not under the control of the subconscious mind of the medium but by the will of an invisible operator who has once lived in the flesh, that operator by his own claims and admissions was once "ex ovo." The facts of psychical research do not contradict any of the broad principles of biology.

Finally, Dr. Lotsy makes the usual blunder of those who, knowing nothing of the elementary principles of psychical research, persist in regarding the medium as the 'guide' in the experiments, whereas the medium is actually in trance and does not know what is going on. I can only repeat that the conditions of the experiments are just exactly what the researchers choose to make them; the facts can be studied and tabulated like other scientific facts. My plea is simply one for assistance instead of obstruction in the attempt to obtain them. To parody Dr. Lotsy's last sentence, "If Science do not so help, then her name is stagnation."

R. J. TILLYARD.

Zürich, Switzerland,

August 26.

MR. CAMPBELL SWINTON'S account in NATURE of August 28 of the incidents connected with the Combermere photograph is both inaccurate and misleading. Since he uses my name so freely perhaps you will permit me to state shortly the true version. The whole story, with the photograph, will be given in the next number of *Psychic Science*—the organ of the Psychic College.

This photograph, which shows plainly the outline of an elderly man seated in an armchair, was sent to me with the endorsement of the Combermere family, who may be expected to know as much about the matter as their relative by marriage. On the back was written that it was taken by a certain lady at the time of the old peer's funeral, and that the shadowy figure was supposed to be the wraith of the

deceased man. This I showed (among fifty other psychic photographs) at the Queen's Hall, simply giving the facts as supplied by the family, and making no assertion myself, since I had no personal knowledge of the matter. Shortly afterwards, several violent letters appeared in the press from Mr. Campbell Swinton, in which he used such injurious terms as "photographic fraud." As to the seated figure, he gave in successive letters three different contradictory explanations; the first that it was a photographic flaw, the second, that the butler had crept into the room and seated himself in the chair; and the third, that plates if kept for some time before development may show strange images. He wound up by challenging me to publish in the *Morning Post* the 'ghost' photograph, alongside of a photograph of the peer taken in life. I at once sent up my photograph without any suggestion whatever that it would not reproduce. That statement is pure invention upon the part of Mr. Campbell Swinton. The editor refused to take the risk of an inferior reproduction, and could only guarantee a good one by touching up, which would be objectionable. A reproduction was afterwards made by the *Daily Sketch*, but whether touched up or not I could not tell.

That is all a technical question with which I had nothing to do. What was, however, strange and rather amusing was that when the photograph of the peer was finally published he proved to be remarkably like the 'ghost,' having a very high forehead and some indication of a short tufted beard. Thus the result of Mr. Swinton's labours was to add one more point to the argument for the authenticity of the picture. There is clear evidence that there was no male visitor or servant in the house who wore a beard.

ARTHUR CONAN DOYLE.

September 1.

[No useful scientific purpose would be served by the discussion in NATURE of the production of spirit photographs or of the reality and origin of the various phenomena manifested during séances with a medium believed to be in a state of trance and to know nothing of what is occurring. The main point of Dr. Tillyard's article in NATURE of July 31 was that scientific men generally presented an unscientific attitude to the subject of psychical research; and he pleaded for critical inquiry in a field hitherto mostly neglected by scientific investigators. This alone is the matter which we think may be usefully discussed in NATURE, or to which we are inclined to devote space.

In his letter Mr. Campbell Swinton raised the question of the alleged spirit photograph of the second Viscount Combermere, his uncle by marriage, and it is only just that Sir Arthur Conan Doyle should be given an opportunity of replying. We do not propose, however, to let other correspondents range themselves on either side in regard to the authenticity of the Combermere photograph, or to submit or expose evidence of psychic phenomena of any other kind. For the present, at any rate, correspondence must be limited to the plea made by Dr. Tillyard for "the scientific study of what are called *super-normal phenomena*."—EDITOR, NATURE.]

The Three-dimensional Reproduction of Tracks of β -particles Ejected by X-rays.

THE use of a stereoscopic camera by C. T. R. Wilson in the photography of tracks of β -particles ejected by pencils of X-rays led to the revelation of two types of asymmetry of initial direction of ejection (*Proc. Roy. Soc., A*, 104, 1923). One is characterised by an excess of tracks having their initial portions in

or near the plane containing the X-ray pencil and its electric vector; the other by an excess of tracks having a forward component in their initial velocities. They have been termed 'lateral' and 'longitudinal' asymmetry respectively. The former distribution reveals the partial polarisation of the primary beam, the preponderance of primary X-rays the electric vector of which is in the plane containing the cathode stream. The latter distribution has been accounted for qualitatively on the basis of Richardson's hypothesis that the absorption of a quantum $h\nu$ of energy by the electron is accompanied by the transference of the momentum of the absorbed radiation causing a resultant motion in the forward direction. A third feature of interest and importance revealed by Wilson's photographs was the existence of short, uni-directional, fish-like tracks with tails towards the X-ray source and produced only by X-rays of wavelength not exceeding about 0.5 Å.U. The phenomena of fish-tracks are most completely and satisfactorily explained by the application of the Compton quantum theory of scattering of X-rays.

In further examination of these features other investigators have adopted the stereoscopic method. F. W. Bubb, in an examination of the initial directions of β -particles ejected by polarised X-rays scattered by a paraffin block, has photographed the tracks directing the camera lens axes end-on to the X-ray pencil for the observation of lateral asymmetry and broadside-on for the observation of longitudinal asymmetry. O. K. de Foe and D. H. Loughridge have examined independently longitudinal asymmetry by stereoscopic photography from the broadside-on position. The latter calculated initial direction of ejection from measurement of depth in the photograph of the end of the initial straight portion by means of a stereocomparator, and of height and breadth by direct measurement by dividers.

The work of F. Kirchner involving the stereoscopic photography of tracks produced by Compton electrons was described by Prof. W. Wien in his paper "On the Direction of Electrons emitted by the Photo-electric and Compton Effects," read before Section A of the British Association on August 10, 1926. Prof. Wien referred to the difficulty of ascertaining correctly, by examination of the photographs stereoscopically, the initial directions of the tracks with reference to the primary X-ray pencil. This difficulty had been met to some extent by the co-option of observers who could not possibly have any 'Compton bias.' I myself experienced this difficulty in some work done in 1924 in which I examined stereoscopically tracks produced by $K\alpha$ copper radiation homogenised by reflection from rock-salt, and was led to consider the possibilities of photography in two directions at right angles eliminating the stereovision difficulty and at the same time increasing very considerably the precision with which the forms and initial directions of tracks could be determined. It appeared, too, that such photography would avoid two other difficulties inherent to stereoscopic examination of lateral asymmetry in which photographs are taken end-on to the pencil. Tracks would be formed across the full width of the cloud-chamber (15 cm., say), and it is impossible under the conditions of the experiment for all to be sharply in focus. Also, even in the absence of this difficulty overlapping and confusion is inevitable.

It was at once evident that the most suitable directions of the lens-axes, using separate single lens cameras and the direction of the primary X-ray pencil being horizontal, would be the vertical and horizontal perpendiculars to the pencil. The photographs so obtained would give the projections of